WHAT IS CLAIMED IS:

1. An electronic key system for a vehicle

2 comprising:

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3 \ an electronic key having first ID

4 (identification data), second ID, and third ID which

is shorter in data length than the second ID, said

electronic key outputting the first ID, the second

ID, and the third ID; and

an on-vehicle apparatus communicating with said electronic key by means of wireless communication, said on-vehicle apparatus having fourth ID, fifth ID, and sixth ID which is shorter in data length than

12 the fifth ID, said on-vehicle apparatus permitting

13 starting an engine of the vehicle when one of first

14 and second conditions is achieved, the first

15 condition including a condition that the second ID

16 outputted from said electronic key corresponds with

17 the fifth ID, the second condition including a

18 condition that the first ID outputted from said

19 electronic key corresponds with the fourth ID and

20 the third ID output ted from said electronic key

21 corresponds with the \sixth ID.

- 1 2. The electronic key system as claimed in claim 1,
- 2 wherein said on-vehicle apparatus permits unlocking
- 3 a vehicle door when the first ID corresponds with
- 4 the fourth ID.
- 1 3. The electronic key system as claimed in claim 1,
- wherein said on-vehicle apparatus requests said
- 3 electronic key to output the first ID when an
- 4 operator carrying said electronic\key executes an
- 5 operation for opening a vehicle door from an outside

- 6 of the vehicle.
- 1 4. The electronic key system as claimed in claim 3,
- 2 wherein said electronic key outputs the first ID
- 3 only when said on-vehicle apparatus requests said
- 4 electronic key to output ID for opening the
- 5 vehicular door.
- 1 5. The electronic key system as claimed in claim 1,
- 2 wherein said on-vehicle apparatus requests said
- 3 electronic key to output the first ID when an
- operator carrying said electronic key approaches the
- 5 vehicle to open the vehicular door.
- 1 6. The electronic key system as claimed in claim 1,
- 2 wherein said on-vehicle apparatus requests said
- 3 electronic key to output the second ID when an
- 4 operator carrying said electronic key executes an
- 5 operation for starting the engine.
- 1 7. The electronic key system as claimed in claim 6,
- wherein said electronic key\outputs the second ID
- 3 only when said on-vehicle apparatus requests said
- 4 electronic key to output ID for starting the engine.
- 1 8. The electronic key system as claimed in claim 2,
- wherein said on-vehicle apparatus\requests said
- 3 electronic key to output the third\ID when the first
- 4 ID corresponds with the fourth ID and when an
- 5 operator carrying said electronic key executes an
- 6 operation for starting the engine.
- 1 9. The electronic key system as claimed\in claim 8,

- 2 satd electronic key outputs the third ID only when
- 3 said on-vehicle apparatus requests said electronic
- 4 key to output the third ID.
- 1 10. The electronic key system as claimed in claim 1,
- 2 wherein the vehicular door has a key cylinder and is
- 3 unlocked by\inserting a key into the key cylinder
- 4 and by turning the key, said on-vehicle apparatus
- 5 permitting starting the engine when the vehicle door
- 6 is unlocked by turning the key inserted in the key
- 7 cylinder and when the second ID outputted from said
- 8 electronic key corresponds with the fifth ID.
- 1 11. The electronic key system as claimed in claim 1,
- 2 wherein said on-vehicle apparatus comprises an
- 3 antenna through which\ said on-vehicle apparatus
- 4 communicates with said\electronic key located within
- 5 a predetermined area outside of the vehicle.
- 1 12. The electronic key system as claimed in claim 1,
- 2 wherein the third ID is a part of the second ID, and
- 3 the sixth ID is a part of the fifth ID.
- 1 13. A method for permitting starting an engine of a
- vehicle, said method comprising:
- checking whether first ID (i\dentification data)
- 4 outputted from an electronic key corresponds with
- 5 first apparatus ID registered in an \on-vehicle
- 6 apparatus;
- permitting unlocking a vehicular door when the
- 8 first ID corresponds with the first apparatus ID;
- 9 requesting the electronic key to output second
- 10 ID when the first ID does not correspond \with the

- 11 first apparatus ID;
 12 checking whether the second ID corresponds with
 13 second apparatus ID registered in the on-vehicle
- 14 apparatus
- permitting starting the engine of the vehicle
- 16 when the second ID corresponds with the second
- 17 apparatus ID;
- 18 requesting the electronic key to output third
- 19 ID, which is shorter in data length than the second
- 20 ID, when the first ID corresponds with the first
- 21 apparatus ID;
- checking whether the third ID corresponds with
- 23 a third apparatus $I\dot{D}$ registered in the on-vehicle
- 24 apparatus; and
- permitting starting the engine when the third
- 26 ID corresponds with the apparatus third ID.
- 1 14. The method as claimed in claim 13, wherein said
- 2 requesting the electronic key to output the second
- 3 ID is executed when an operation for starting the
- 4 engine is executed without checking the first ID.
- 1 15. An electronic key system \for a vehicle
- 2 comprising:
- an electronic key having first ID
- 4 (identification data) and second \ID, said electronic
- 5 key outputting the first ID, the second ID and a
- 6 part of the second ID according to \a request; and
- 7 an on-vehicle apparatus communicating with said
- 8 electronic key by means of wireless communication,
- 9 said on-vehicle apparatus having third\ ID and fourth
- 10 ID, said on-vehicle apparatus requesting said
- 11 electronic key to output the part of the second ID

- 12 when the first ID outputted from said electronic key
- 13 corresponds with the third ID, said on-vehicle
- 14 apparatus permitting starting an engine of the
- 15 vehicle when the part of the second ID outputted
- 16 from said electronic key corresponds with a part of
- 17 the fourth ID.
- 1 16. An electronid key system for a vehicle
- 2 comprising:
- an electronic key having first ID
- 4 (identification data) second ID, and third ID which
- is shorter in data length that the second ID, said
- 6 electronic key outputting the first ID, the second
- 7 ID and the third ID; and
- an on-vehicle apparatus communicated with said
- 9 electronic key by means of wireless communication,
- 10 said on-vehicle apparatus having fourth ID and fifth
- 11 ID, said on-vehicle apparatus deciding to start an
- 12 engine of the vehicle when the first ID outputted
- 13 from said electronic key corresponds with the fourth
- 14 ID and when the third ID outputted from said
- 15 electronic key corresponds with a part of the fifth
- 16 ID.